Introduction of the GCV IFV in 2017 provides flexibility to our Army. Vehicles displaced by the GCV IFV may then replace selected M113 family of vehicles such as command and control, medical evacuation and mortar carrier, allowing us to begin divestiture of the M113 family of vehicles. Upgrades to existing Bradley and Stryker vehicles may be considered as risk mitigation based on the rate at which the GCV is introduced. The number of BCTs equipped is tied to the operational demand represented by ARFORGEN.

The sequence of following GCV variants will be determined from continuing analysis of operational capability, capacity for adaptation, sustainment burdens, operational demands and affordability. The acquisition strategy enabled by the modular design of the Ground Combat Vehicle allows for incremental improvements synchronized with ARFORGEN demand, changes in the operational environment and technology maturation.

## Summary

Our Army will continue to operate in an uncertain and complex environment. Our ability to adapt faster than our adversaries is essential to maintaining battlefield primacy. A modernization strategy synchronized with ARFORGEN and focused on deploying units provides the agility required to quickly adapt. An incremental approach to combat vehicle modernization, centered on the Ground Combat Vehicle, synchronized with upgrades, reset and divestiture of existing vehicles is the most effective way to improve capability in the near-term, mitigate risk associated with identified operational shortfalls and provide our Army the agility to adapt to the ever-changing operational environment.


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## Army Operations

Army operations under conditions of uncertainty and complexity in an era of persistent conflict require a versatile mix of forces that are tailorable, networked, and organized under a rotational cycle to sustain the flow of trained and ready units, provide a hedge against unexpected contingencies, and operate at a sustainable tempo for the all-volunteer force.

The Army Capstone Concept describes the broad capabilities our Army will require in 2016-2028 to apply finite resources to overcome a combination of hybrid threats, adaptive adversaries, and enemies in complex operating environments. Our Army's ability to adapt faster than our adversaries is essential to maintaining battlefield primacy.

## Army Modernization

Rapid changes in the operational environment demand a new approach to Army modernization, synchronized with Army Force Generation (ARFORGEN), focused on deploying units, and agile enough to quickly adapt. Grounded projections of the future operational environment as well as technology maturation contribute to a resource informed, outcomes based, incremental modernization strategy.

Recent capabilities based assessments identify operational shortfalls, or gaps, that must be addressed to maintain battlefield primacy, particularly in force protection and mobility. Vehicle attribute assessments of current combat vehicles identify force protection as the most important attribute regardless of mission role or Brigade Combat Team (BCT) type. Operational lessons learned show that on a non-linear, complex battlefield all vehicles require an unprecedented level of protection and mobility.

## The Incremental Approach

Timing of modernization is critical. Soldiers are fighting everyday and deserve the best combat vehicles that our Army can provide. The development and deployment of a new Ground Combat Vehicle, synchronized with upgrades, reset and divestiture of current vehicles is the most effective and affordable way to improve capability in the near-term, mitigate risk associated with identified operational shortfalls and provide our Army the agility to adapt and versatility to meet the challenges of an ever-changing operational environment.

Combat vehicles' effectiveness is characterized by several operational attributes. The ability to provide mobile armored protection for Soldiers and occupants is paramount to mission accomplishment. The ability of the vehicle itself to survive on the battlefield affects the unit's ability to continue operations.

The ability to provide precise lethal and nonlethal fires is critical for effective operations among populations. Mobility on and off roads is essential, enabling commanders to readily move Soldiers to a position of advantage. And a combat vehicle's sustainability is important- the ability to stay in operation longer, and be rapidly repaired and returned to operations is vital. Regardless of mission role (main battle tank, infantry fighting vehicle, reconnaissance, command and control, medical evacuation and treatment, engineer support, fire support, mortar and artillery) these attributes characterize a combat vehicle's effectiveness.

It is against these operational attributes and the projected threats over time that drives the Army's Ground Combat Vehicle strategy. Upgrading combat vehicles that have sufficient capability and the capacity to adapt and grow leverages our most effective platforms. Resetting combat vehicles that have sufficient capability but limited capacity to adapt to future requirements extends current capability until it must be replaced. Divesting those vehicles that do not have sufficient capability or capacity to adapt minimizes sustainment of our least effective systems. Finally, fielding variants of a new Ground Combat Vehicle that meet the projected battlefield requirements and have the design growth to allow for adapting capabilities as the operational environment changes and as technology matures best positions our Soldiers for continued success.

## An Assessment

The Abrams maintains its domination as the premier main battle tank, providing mobile protected firepower to our Soldiers in almost all environments. Its visionary design that accounted for growth from the outset allows it to continue to adapt. The Abrams can be upgraded to meet operational demands in the near to midterm.

The Bradley family of vehicles, completing its third decade of service, combines speed, mobility and firepower but is near its physical design limits and has limited capacity to adapt. The Stryker's on-road speed and troop carrying capacity provide a tremendous operational capability, but it possesses little developmental potential. Both the Bradley and Stryker families of vehicles can be reset in the near term until they begin replacement in the midterm.

The MRAP has proven effective in protecting Soldiers from IEDs, but its lack of protection from other threats, limited fighting ability, the vehicle's slow speed and lack of off-road mobility limits the ability to move Soldiers to positions of advantage on the battlefield. The Army continues to integrate MRAP into our brigade formations as well as our generating force to maximize the capability for troop transport, reconnaissance, convoy protection, route clearance and medical evacuation.

The M113 family of vehicles, in service for nearly five decades is our least capable vehicle, and the one with least capacity for adaptation. The M113 family will be sustained only until it is replaced. Initial replacement for certain mission roles comes from a combination of MRAPs, Strykers and Bradleys as they are displaced by the Ground Combat Vehicle.

## The Ground Combat Vehicle

The Ground Combat Vehicle's incremental development approach enables initial fielding and deployment by 2017, while establishing a basis from which to adapt. Capabilities incorporated in subsequent increments will be based on changes in the operational environment and enabled by maturation of developing technology. The GCV's modular design allows for growth in size, weight, power and cooling which enables rapid integration of improved capabilities in subsequent increments

The GCV is versatile. Its modular design, particularly for armor and armaments, provides commanders with configuration and employment options, and complements the Army's versatile mix of forces. GCV variants are employed by BCTs across the full range of military operations and in combination with other vehicles, task-organized based on mission requirements. Additionally, the GCV enhances versatility with growth potential to adapt as technologies mature and enemies learn.

The GCV provides improved force protection to our Soldiers. The first GCV increment provides all occupants explosive blast protection equivalent to MRAP as well as the ability to observe 360 degrees from inside the vehicle. All increments will integrate state of the art protection measures, both passive and active, as technology matures and lighter materials are available to provide comparable protection.

The GCV provides full tactical mobility, able to negotiate the confined spaces presented in complex urban terrain, with cross country mobility to preclude being restricted to existing road networks. GCV has sufficient speed to enable rapid movement of Soldiers to positions of advantage in fluid operations. The first GCV increment provides mobility and maneuverability equivalent to the Bradley with better protection against all threats.

The GCV reduces the BCT sustainment burden through improved reliability, maintainability, availability and energy efficiency. Improved reliability keeps Soldiers in the fight because the GCV operates longer between system failures. Improved maintainability gets Soldiers back in the fight faster because the GCV can be repaired faster, increasing operational availability. Increased energy efficiency which balances the fully burdened cost of fuel with mobility and force protection means less demand for fuel at comparable weights and reduced exposure for logistics assets. The GCV provides exportable electrical power, a crucial capability for humanitarian relief and stability operations. It provides battery charging capability for Soldier systems, reducing the battery burden carried by our Soldiers.

The GCV operates effectively with current Army and joint service systems, as well as systems in development. GCV hosts the Army's battle command network systems, and possesses growth potential in electrical and computing power to incorporate changes as network systems evolve. These vehicles also retain mission functionality with a degraded or interrupted network. GCV facilitates Soldier integration into the network, employment of air and ground robotic systems, and enables access to joint capabilities at all levels.

## The Infantry Fighting Vehicle First

Introducing the Infantry Fighting Vehicle (IFV) as the first variant of the GCV is essential. Operations today and as envisioned in the near future take place among populations, on distributed battlefields, by Soldiers organized in small units. Infantry Companies, Reconnaissance Troops, and the Soldiers supporting them are at the point of the spear. Providing the IFV variant first provides the best capability, supporting the greatest and most challenging operational demand.

The IFV provides force protection that enables close operations among the people. Its mobility is critical to moving Soldiers to a position of advantage, and its armored protected mobility enables distributed operations- a defining characteristic of operations today and in the future. The IFV also enables the precise application of combat power, both lethal and non-lethal, a crucial capability for close operations among the people The IFV helps connect dismounted Soldiers to the battle command network, enabling collaboration and enhancing agility.

### Ground Combat Vehicle Operational Design Principles

- Versatility
- Force Protection
- Expeditionary
- Lethality
- Mobility
- Sustainability
- Network Integration & Interoperability